

Remarks

Claim Amendments

Claims 63, 69, 75 and 77 have been amended to clarify the limitation that the iron (II) sulphate monohydrate compound is “produced” by a particular process, rather than “producible” by the process. No new matter has been added.

Election / Restrictions

Claims 46-78 were pending in the application. The Examiner has withdrawn Claims 46-62, 67, 68 and 73-78 from consideration. Claims 63-66 and 69-72 are pending in the application and have been rejected.

The present response is being filed along with a Request for Continued Examination. All of the pending claims (Claims 46-72) contain the technical limitation that “an iron (II) sulphate monohydrate-containing precipitate, which is produced by concentrating an iron (II) sulphate monohydrate-containing used sulphuric acid and separating the sulphuric acid from the obtained precipitate” is used in the method. For the reasons stated below, the technical feature common to all of the claims imparts patentability over the prior art. Furthermore, Applicants’ previous amendments, in particular, the amendments filed on July 21, 2009 should be entered in the case and Applicants respectfully request the same.

Rejections under 35 USC § 103(a)

Claims 63-66 and 69-72 were rejected under 35 USC § 103(a) as being unpatentable over Larson ‘321, in view of Cody et al. ‘886. In particular, the Examiner finds that Larsen teaches a method of reducing soluble chromate in cement comprising mixing the cement with iron (II) sulphate monohydrate. Larson does not teach obtaining the iron (II) sulphate monohydrate by concentrating sulfuric acid. Nevertheless, the Examiner maintains that it is Applicants’ burden to demonstrate that the iron (II) sulphate monohydrate produced by concentrating an iron (II) sulphate monohydrate-containing used sulphuric acid and separating the sulphuric acid from the obtained precipitate is materially different.

Cody et al. teach a process to obtain iron (II) sulphate heptahydrate by crystallization from sulfuric acid.

The Examiner finds that it would have obvious to dry the iron (II) sulphate heptahydrate of Cody et al., to produce iron (II) sulphate monohydrate for use in chromate reduction in cement, as taught by Larsen.

Applicants' Response

Applicants can demonstrate that the “iron (II) sulphate monohydrate produced by concentrating an iron (II) sulphate monohydrate-containing used sulphuric acid and separating the sulphuric acid from the obtained precipitate” in the claimed method has materially different properties relative to the use of iron (II) sulphate monohydrate obtained by drying iron (II) sulphate heptahydrate. In particular, the claimed reducing agent is significantly superior in its chromate reducing effect, in cement.

In support of their position, Applicants submit the test report of IBAC (Institute of Building Materials Research Aachen) in Germany. The original report is in German and an English language translation is included, identified as Exhibit A and B, respectively, hereto.

Various reducing agents were tested. The ones of particular relevance are Samples CR E and CR G, which are identified below.

CR E

Sample CR E is an iron (II) sulphate monohydrate reducing agent produced by concentrating iron (II) sulphate monohydrate-containing used sulphuric acid and separating the sulphuric acid from the obtained precipitate. The sample was not dried. The sample had the following composition:

Ti / Fe ratio of 10.2% by weight

Mn / Fe ratio of 2% by weight

Crystallite size of less than 2 μm

CR G

Sample CR G is an iron (II) sulphate monohydrate reducing agent produced by drying iron (II) sulphate heptahydrate. The sample had the following composition:

Ti / Fe ratio of 0.8% by weight

Mn / Fe ratio of 0.3% by weight

The test procedure and results are set forth in Section 3 of the test report and Tables 1 and 2. The concentration of ferrous ions in each of the samples of reducing agent was determined, and the concentration of chromate in the cement was determined. The amount of the reducing agent added to the cement was adjusted to produce a stoichiometric ratio of reducing agent to chromate content of either 8:1 or 12:1. The materials were blended and shaken for 24 hours, and the chromate content was determined by two different methods (Table 1 and Table 2).

For convenience sake, the results from Tables 1 and 2 for Samples CR E and CR G, are reproduced below.

Table 1 Results of the determination of chromate according to TRGS 613

Sample	Amount of chromate after mixing the cement with the chromate reductant	
	8:1 Stoichiometric ratio	12:1 Stoichiometric ratio
CR E	4.0 mg/kg	0.1 mg/kg
CR G	7.2 mg/kg	0.8 mg/kg

Table 2 Results of the determination of chromate according to DIN EN 196-10

Sample	Amount of chromate after mixing the cement with the chromate reductant	
	12:1 Stoichiometric ratio	
CR E	<0.01 mg/kg	
CR G	3.5 mg/kg	

Applicants submit that the manufacturing steps incorporated into the subject claims have been demonstrated to produce a reducing agent having significantly improved properties for reducing the chromate content of cement. Thus, Applicants have met their burden of showing an unobvious and unexpected difference between the claimed method and the prior art, namely the chromate reducing efficacy of an iron (II) sulphate monohydrate reducing agent that is the product of concentrating iron (II)

sulphate monohydrate-containing used sulphuric acid and separating the sulphuric acid from the obtained precipitate.

Conclusion

Applicants submit that the pending claims are in condition for allowance. Furthermore, the claimed technical feature of the invention, that is, the iron (II) sulphate monohydrate is the product of a particular process, is common to all of the claims in the application (Claims 46-78). Accordingly, Applicants request that any claim that has been withdrawn be reinstated.

If the Examiner is of a different opinion with regard to allowance and the unity of Claims 46-78, Applicants counsel request a telephone interview to discuss the application.

Sincerely,



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